Lockheed Martin Corporation
Corporate Environment, Safety & Health
West Coast Projects Office
2550 North Hollywood Way, 3rd Floor, Burbank, CA 91505-1055
Facsimile 818-847-0256 or 818-847-0170

LOCKHEED MARTIN

Via Federal Express
CAY0299/069
WBS# 48720

February 15, 1999

Mr. Gerard J. Thibeault
Executive Officer
California Regional Water Quality Control Board
Santa Ana Region
3737 Main Street, Suite 500
Riverside, California 92501-3339

Subject: **January 1999 Data Report**
Water Supply Contingency Plan
Production Well Sampling Program
Crafton-Redlands Plume Project

Dear Mr. Thibeault:

In compliance with the approved Water Supply Contingency Plan, enclosed please find one copy of the **January 1999, Production Well Sampling Program** report prepared by HSI-Geotrans for the Lockheed Martin Corporation. This report presents analytical results from samples collected at Bunker Hill Basin Production Wells in January of 1999. Laboratory Quality Assurance/Quality Control documentation is in Attachment C which is also enclosed for your review.

Should you have any questions, comments, or requests, please contact Tom Blackman at (818) 847-0791 or John Hemmans at (818) 847-0191.

Sincerely,

Carol A. Yuge
Director

Enclosures

cc: See Attached Distribution List

Distribution:

cc: (Abbreviated Report Without Attachments "A, B, & C" Which are Available Upon Request)
Kalyanpur Baliga, Department of Health Services (San Bernardino)
Tom Bartol, USAF, Norton Air Force Base
Henry Dennis, Mountainview Power Company
Dodie Farmer, Victoria Farms Mutual Water Company
Douglas Headrick, San Bernardino Valley Water Conservation District
Mike Huffstutler, City of Redlands
Ross Lewis, Gage Canal Company
Kevin Mayer, US EPA (Region IX)
Steve Mains, Western Municipal Water District
Morris Matson, Loma Linda University
Eugene McMeans, Riverside Highland Water Company
Zahra Panahi, City of Riverside
Dan Randall, City of Riverside
Bob Reiter, San Bernardino Valley Municipal Water District
Toby Roy, Department of Health Services (San Diego)
Alain Sharp, Earth Technology Corporation
Greg Snyder, City of Loma Linda
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Dieter Wirtzfeld, City of Riverside

HSI GEOTRANS
A TETRA TECH COMPANY

3150 Bristol Street
Suite 500
Costa Mesa, California
92626

714-513-1415 FAX 714-513-1278

February 19, 1999

Lockheed Martin Corporation
West Coast Project Office
2550 N. Hollywood Way, 3rd Floor
Burbank, California 91505

Attention: Mr. John Hemmans
Project Coordinator

Subject: January 1999 Data Report
Water Supply Contingency Plan
Production Well Sampling Program
Crafton-Redlands Plume Project

Dear Mr. Hemmans:

This report presents a summary of field procedures, protocols, and results of the Water Supply Contingency Plan production well sampling for the month of January 1999. The Water Supply Contingency Plan (WSCP) was prepared by Lockheed Martin Corporation and submitted to the State of California Regional Water Quality Control Board (RWQCB) Santa Ana Region on September 30, 1996. The plan was conditionally approved by the RWQCB in a letter dated March 6, 1997. The WSCP for the Crafton-Redlands Plume was prepared to address maintenance of water supply to purveyors in the event that wells became impacted with trichloroethene (TCE) from the Crafton-Redlands TCE Plume. A summary of key dates and WSCP sampling program evolution is provided on Table 1.

The locations of the WSCP wells and analytical results for the January 1999 sampling event for TCE and perchlorate are shown on Figures 1 and 2, respectively. Table 2 presents a summary of analytical tests performed on each WSCP well and water system sampling points. The sampling frequency of each well is once a month for the first year. More frequent sampling, if required, is based on the analytical results as outlined in the WSCP TCE and perchlorate decision matrices, provided as Figures 3 and 4, respectively. The perchlorate decision matrix was presented in the *Perchlorate Work Plan and Schedule*, which was submitted, to the RWQCB on August 15, 1997. The RWQCB approved the Perchlorate Work Plan on

October 31, 1997. Table 3 presents a summary of the wells sampled twice monthly according to the decision matrices.

RESULTS

A summary of the analytical results for the January 1999 WSCP sampling event for TCE and perchlorate is shown on Figures 1 and 2, respectively, and presented on Table 4. Available groundwater elevation data is provided on Table 5. Chain-of-custody and laboratory data sheets are in Attachment B and Level III QA/QC documentation is in Attachment C. Attachments A, B, and C are available upon request.

Trichloroethene

Trichloroethene was detected at or above the detection limit of 0.5 μg/L in six wells and two water system sampling points including; COLL Mountain View #1 (0.92 μg/L), Richardson #2 (2.0 μg/L), Gage 26-1 (11 μg/L), Gage 27-1 (10 μg/L), Gage 27-2 (1.6 μg/L), Gage 29-2 (2.4 μg/L), Gage Delivery (1.1 μg/L), and 7th & Chicago (0.61 μg/L) as shown on Figure 1 and Table 4.

Groundwater samples collected from the remaining WSCP wells and system sampling points did not detect TCE including: nine Gage wells (Gage 29-1, Gage 30-1, Gage 46-1, Gage 51-1, Gage 56-1, Gage 66-1, Gage 92-1, Gage 92-2, and Gage 92-3), two COLL wells (Richardson #1 and Richardson #3), the SCE #2 (AUX) well, one City of Riverside water system sampling point (Iowa Booster), and three City of Loma Linda sampling points (Mountain View Blend – Timoteo, Mountain View Blend – Lawton, and Richardson Blend).

Four groundwater samples collected in January met or exceeded the MCL for TCE of 5.0 μg/L or 2/5th the MCL for TCE (2.0 μg/L) including: COLL Richardson #2 (2.0 μg/L), Gage 26-1 (11 μg/L), Gage 27-1 (10 μg/L), and Gage 29-2 (2.4 μg/L). The TCE impacts at Gage 26-1 and Gage 27-1 are attributed to the Norton AFB plume, thus, more frequent TCE sampling will not be implemented. The TCE impacts at Gage 29-2 are wholly or partially attributed to the Norton AFB plume, thus, more frequent sampling will be implemented. A confirmation sample was collected from Richardson #2 on January 19,1999. The January 19, 1999 sample was split and analyzed at Del Mar and Babcock. The results of the confirmation samples were below the detection limit of 0.5 μg/L for TCE. Thus, more frequent sampling of Richardson #2 for TCE will not be implemented at this time.

Perchlorate

In January 1999, perchlorate was detected at or above the detection limit of 4µg/L in three COLL wells (Mountain View #2, Richardson #1, and Richardson #2), two COLL water system sampling points (Mountain View Blend at Lawton and Mountain View Blend at Timoteo), nine City of Riverside Gage wells (Gage 26-1, Gage 27-1, Gage 27-2, Gage 29-1, Gage 29-2, Gage 46-1, Gage 51-1, Gage 66-1, and Gage 92-1) as presented on Figure 2 and Table 4. Gage 29-3 was off-line during January and was not sampled.

In the January WSCP sampling, perchlorate was detected at or above 75 percent (13.5 µg/L) of the PAL in three wells (COLL Mountain View #2, COLL Richardson #2 and Gage 29-2). Mountain View #2 and Gage 29-2 are currently being sampled on a twice a month basis. The monthly sample collected from COLL Richardson #2 on January 5, 1999 detected perchlorate at a concentration (34 µg/L) above the PAL. As per the perchlorate decision matrix, on January 19, 1999, a confirmation sample was collected from Richardson #2 and submitted to Del Mar and a split sample submitted to Weck Laboratory. The confirmation sample results were below 75 percent of the perchlorate PAL (5.4. µg/L and 7.8 µg/L for Del Mar and Weck Laboratory, respectively). Thus, the perchlorate result was not confirmed and the well will continue to be sampled once a month.

CLOSING

HSI GeoTrans greatly appreciates being of continued service to Lockheed Martin Corporation on this project. Should you have any questions or comments, please do not hesitate to call.

Sincerely,
HSI GEOTRANS

Roy J. Marroquin
Project Manager

James C. Norman, R.G., C.HG.
Project Director

TABLES

TABLE 1

KEY PROJECT DATES AND WSCP SAMPLING PROGRAM EVOLUTION

September 30, 1996, Lockheed Martin submitted the Water Supply Contingency Plan (WSCP) to the RWQCB – Santa Ana Region;
March 6, 1997, the RWQCB conditionally approved the WSCP, which included sampling eight production wells (City of Loma Linda Richardson #1, Richardson #2, Mountain View #1, Mountain View #2, Victoria Farms Mutual Water Company Wells #1 and #3, and Southern California Edison #1 and #2);
June 1997, Victoria Farms Mutual Water Company was connected to City of San Bernardino Water. Pumping ceased at VFMWC #1 and #3, and the two wells were removed from the program;
June 1997, sampling of SCE #1 was discontinued due to sampling logistics. The WSCP consists of five wells, including COLL Mountain View #1 and #2, COLL Richardson #1 and #2, and SCE #2 (AUX);
August 1997, the WSCP was expanded due to the detection of perchlorate in municipal supply wells in the Bunker Hill Basin. Twenty-six wells were added to the WSCP including nineteen City of Riverside wells, five City of Redlands wells, and two Loma Linda University wells, for a total of 31 wells;
October 1997, three City of Riverside water system sampling points were added to the WSCP, including the Gage system pipeline (Gage Delivery), the Waterman system pipeline (Iowa Booster), and the sampling station measuring outflow from the Linden and Evans Reservoirs (7^{th} & Chicago);
March 1998, two City of Loma Linda water system sampling points were added to the WSCP, including the Mountain View system pipeline (Mountain View Blend at Lawton) and the Richardson system pipeline (Richardson Blend);
June 1998, one City of Riverside irrigation water system sampling point (Gage Arlington) and one additional City of Loma Linda water system sampling point (Mountain View Blend at Timoteo) were added to the WSCP.
December 1998, COLL Richardson #3 Well Added to WSCP Sampling Program.

TABLE 2

WSCP PRODUCTION WELL SAMPLING PROGRAM

HSI#	Well Name	Perchlorate	TCE
City of Loma Linda			
691	Mountain View #1	X	X
692	Mountain View #2	X	X
693	Richardson #1	X	X
694	Richardson #2	X	X
707	Richardson #3	X	X
City of Loma Linda Water System Sampling Points			
2967	Mountain View Blend - Lawton	X	X
3016	Mountain View - Timoteo	X	X
2968	Richardson Blend	X	X
Southern California Edison			
554	SCE#2(AUX)	X	X
Loma Linda University			
267	LLUniv Anderson #2	X	
717	LLUniv Anderson #3	X	
City of Riverside (Gage System)			
252	Gage#26-1	X	X
258	Gage#27-1	X	X
259	Gage#27-2	X	X
260	Gage#29-1	X	X
219	Gage#29-2	X	X
220	Gage#29-3	X	X
218	Gage#30-1	X	X
214	Gage#31-1	X	X
215	Gage#46-1	X	X
253	Gage#51-1	X	X
216	Gage#56-1	X	X
257	Gage#66-1	X	X
644	Gage#92-1	X	X
641	Gage#92-2	X	X
642	Gage#92-3	X	X
645	Gage 6New	X	X
City of Riverside (Waterman System)			
273	Hunt#6	X	
271	Hunt#10	X	
272	Hunt#11	X	
City of Riverside Water System Sampling Points			
2946	Iowa Booster (Waterman)	X	X
2947	Gage Delivery (Gage)	X	X
2948	7th & Chicago (Reservoir)	X	X
3018	Gage Arlington	X	X
City of Redlands			
542	COR Church St	X	
2673	COR#38	X	
535	COR Mentone Acres	X	
29	COR Orange st	X	
74	CORRees	X	X

Notes:

TCE = Trichloroethene

Perchlorate analyzed using DHS Method (EPA 300.0 Modified)

TCE analyzed using EPA Method 502.2

TABLE 3

WSCP PRODUCTION WELL SAMPLING PROGRAM
JANUARY 1999 WELLS SAMPLED TWICE MONTHLY

HSI#	Well Name	Perchlorate	TCE
City of Loma Linda			
692	Mountain View #2	X	
City of Riverside (Gage System)			
219	Gage #29-2	X	
220	Gage #29-3	X	

Notes:

TCE = Trichloroethene

Perchlorate analyzed using DHS Method (EPA 300.0 Modified).

TCE analyzed using EPA Method 502.2.

In January Gage 29-2 was sampled once and Gage 29-3 was not sampled because the wells were off-line.

TABLE 4
WSCP PRODUCTION WELL SAMPLING PROGRAM
JANUARY 1999 DATA RESULTS

HSI#	Well Name	Sample Date	Perchlorate (ppb) Del Mar	TCE (ppb) Del Mar
City of Loma Linda				
692	Mountain View #2	1/5/99	24	0.92
692	Mountain View #2*	1/19/99	8.9	NA
693	Richardson #1	1/5/99	7.3	ND(0.5)
694	Richardson #2	1/5/99	34	2.0
694	MUN-726	1/5/99	33	2.0
694	Richardson #2	1/19/99	5.4	ND(0.5)
694	Richardson #2 - Split (Weck)	1/19/99	7.8	NS
694	Richardson #2 - Split (BAB)	1/19/99	NS	ND(0.5)
707	Richardson #3	1/5/99	ND(4)	ND(0.5)
City of Loma Linda Water System Sampling Points				
2967	Mountain View Blend-Lawton	1/5/99	6.2	ND(0.5)
3016	Mountain View Blend-Timoteo	1/5/99	6.0	ND(0.5)
2968	Richardson Blend	1/5/99	ND(4)	ND(0.5)
Southern California Edison				
554	SCE#2(AUX)	1/4/99	ND(4)	ND(0.5)
Loma Linda University				
267	LLUniv Anderson #2	NS	NS	NS
717	LLUniv Anderson #3	NS	NS	NS
City of Riverside (Gage System)				
252	Gage#26-1	1/15/99	7.6	11
258	Gage#27-1	1/6/99	6.7	10
259	Gage#27-2	1/6/99	8.3	1.6
260	Gage#29-1	1/6/99	9.5	ND(0.5)
219	Gage#29-2	1/6/99	18	2.4
219	MUN-727	1/6/99	19	2.5
219	Gage 29-2*	1/15/99	21	NA
220	Gage#29-3	NS	NS	NS
220	Gage#29-3*	NS	NS	NS
218	Gage#30-1	1/5/99	ND(4)	ND(0.5)
214	Gage#31-1	NS	NS	NS
215	Gage#46-1	1/4/99	7.5	ND(0.5)
253	Gage#51-1	1/6/99	11	ND(0.5)
216	Gage#56-1	1/4/99	ND(4)	ND(0.5)
257	Gage#66-1	1/6/99	12	ND(0.5)
644	Gage#92-1	1/5/99	9.2	ND(0.5)
641	Gage#92-2	1/5/99	ND(4)	ND(0.5)
642	Gage#92-3	1/5/99	ND(4)	ND(0.5)
City of Riverside (Waterman System)				
273	Hunt#6	NS	NS	NA
271	Hunt#10	NS	NS	NA
272	Hunt#11	NS	NS	NA
City of Riverside Water System Sampling Points				
2946	Iowa Booster (Waterman)	1/7/99	ND(4)	ND(0.5)
2946	MUN-728	1/7/99	ND(4)	ND(0.5)
2947	Gage Delivery (Gage)	1/7/99	6.0	1.1
2948	7th & Chicago (Reservoir)	1/7/99	ND(4)	0.61
3018	Gage Arlington	1/7/99	5.7	NA
City of Redlands				
542	COR Church St[a]	NS	NS	NA
2673	COR#38[a]	NS	NS	NA
535	COR Mentone Acres[a]	NS	NS	NA
29	COR Orange St[a]	NS	NS	NA
74	COR Rees	NS	NS	NS

Notes:

* = Twice-monthly sampling result

[a] = Well sampled on quarterly basis, if active

NA = Not analyzed for that compound

NS = Not sampled (Well off-line)

ND(4) = Not detected at the specified limit

MUN = Duplicate sample collected from the well listed directly above

TCE = Trichloroethene

DEL MAR = Del Mar Analytical Laboratory of Irvine, CA

BAB = Babcock & Sons Laboratory of Riverside, CA

WECK = Weck Laboratories of City of Industry, CA

Perchlorate analyzed using DHS Method (EPA 300.0 Modified)

TCE analyzed using EPA Method 502.2

TABLE 5

SUMMARY OF WATER LEVEL MEASUREMENTS
JANUARY 1999 SAMPLING EVENT

HSI#	Well Name	Measure Date	Depth to Water	Measuring Point Elevation	Groundwater Elevation	Comments
CITY OF LOMA LINDA						
692	Mountain View #2	01/04/99	176	1085	909	Pumping
693	Richardson #1	01/04/99	134	1077	943	Static
694	Richardson #2	01/04/99	122	1078	956	Static
707	Richardson #3	01/04/99	138	NA	NA	Static
Southern California Edison						
554	SCE#2(AUX)	NM	NM	1100.00	NM	Pumping
Loma Linda University						
267	LLUniv Anderson #2	NM	NM	1075	NM	Pumping
717	LLUniv Anderson #3	NM	NM	1070	NM	Pumping
City of Riverside (Gage System)						
252	Gage#26-1	01/05/99	65.20	1045.33	980.13	Static
258	Gage#27-1	01/05/99	64.20	1044.64	980.44	Static
259	Gage#27-2	01/05/99	80.90	1044.64	963.74	Pumping
260	Gage#29-1	01/05/99	82.80	1044.43	961.63	Pumping
219	Gage#29-2	01/05/99	60.20	1046.31	986.11	Static
220	Gage#29-3	01/05/99	61.80	1048.75	986.95	Static
218	Gage#30-1	01/05/99	180.30	1054.17	873.87	Pumping
214	Gage#31-1	01/05/99	66.30	1054.64	988.34	Static
215	Gage#46-1	01/05/99	136.20	1065.50	929.30	Pumping
253	Gage#51-1	01/05/99	179.90	1044.64	864.74	Pumping
216	Gage#56-1	01/05/99	163.90	1065.50	901.60	Pumping
257	Gage#66-1	01/05/99	136.10	1044.85	908.75	Pumping
644	Gage#92-1	01/05/99	180.70	1047.78	867.08	Static
641	Gage#92-2	01/05/99	125.00	1053.38	928.38	Pumping
642	Gage#92-3	01/05/99	130.00	1058.78	928.78	Static
City of Riverside (Waterman System)						
273	Hunt#6	NM	NM	1015.5	NM	Pumping
271	Hunt#10	NM	NM	1017	NM	Pumping
272	Hunt#11	NM	NM	1015.7	NM	Pumping
City of Redlands						
542	COR Church St	Jan-99	91.0	1344.8	1253.8	Static
2673	COR#38	Jan-99	54.0	NA	NA	Static
535	COR Mentone Acres	Jan-99	143.0	1506.4	1363.4	Static
29	COR Orange st	Jan-99	135.0	1282	1147.0	Static
74	COR Rees	Jan-99	181.0	1490	1309.0	Static

Notes:

All measurements reported in feet below measuring point (ft-bmp)

Water level measurements for all City of Loma Linda, City of Riverside, and City of Redlands wells were obtained by purveyor personnel.

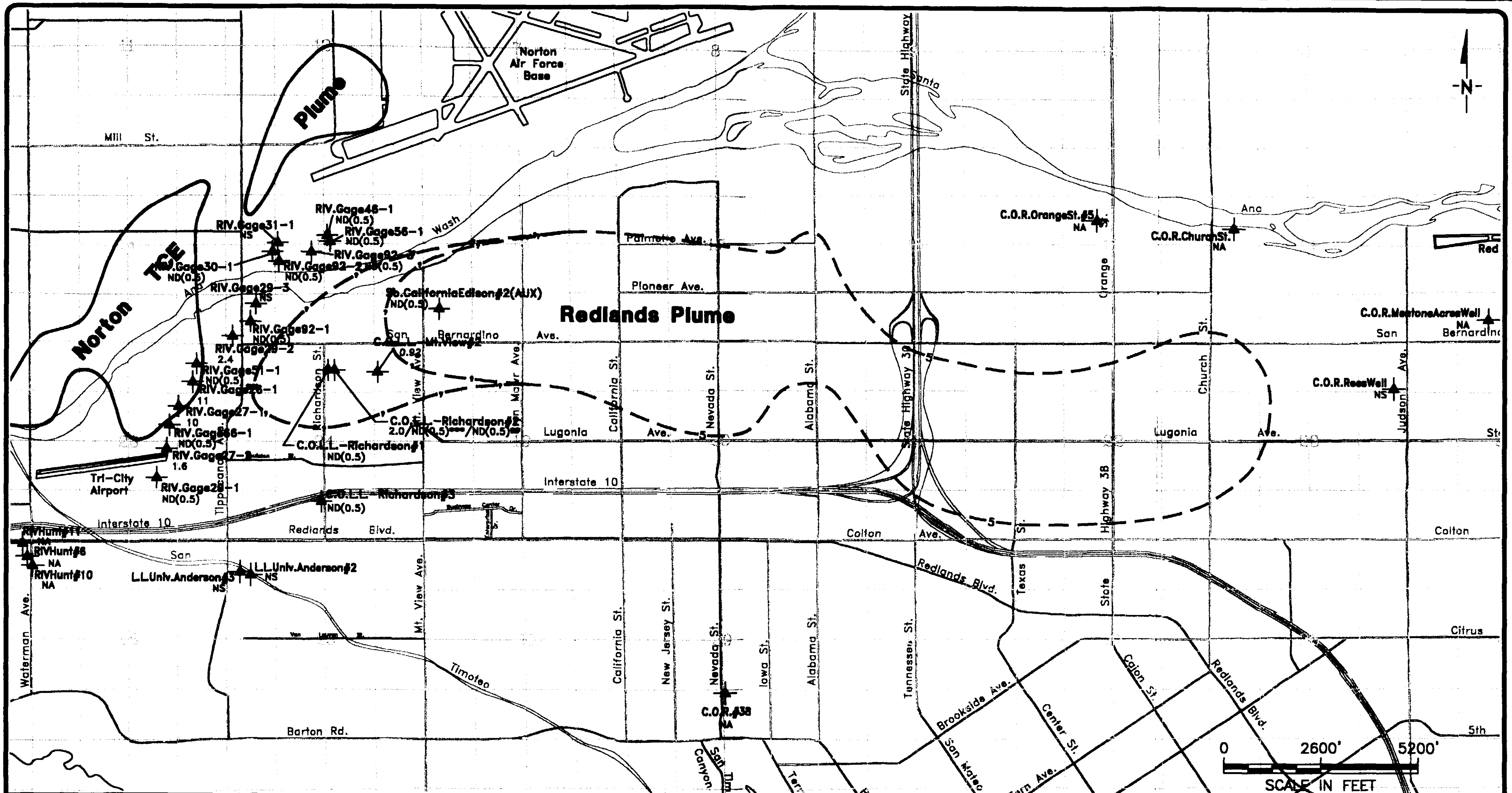
Elevations given in feet above mean sea level (ft-msl)

NM=Not measured

NA=Data not available

Wells that were pumping were shut down and allowed to recover a minimum of 30 minutes for a static water level measurement.

FIGURES



EXPLANATION

Wells Currently Sampled Under the Existing WSCP Sampling Program

2.2 TCE Results (µg\L)

— — 5 — Approximate TCE Plume Location 5 µg\L (1998 Interpretation of Redlands Plume)

——5—— Approximate TCE Plume Location 5 µg\L (1998 Interpretation of Norton AFB Plume, by Norton)

Project 5 µg\L TCE Contour in Hydrostratigraphic Unit 2

Project 5 µg\L TCE Contour in Hydrostratigraphic Unit 4

ND(0.5) Not Detected at Indicated Detection Limit

NS Not Sampled

NA Not Analyzed

** Split Sample Result

*** Confirmation Sampling Result

ND(0.5) C.O.L.L. Mountain View Blend at Lawton

ND(0.5) C.O.L.L. Mountain View Blend at Timoteo

ND(0.5) C.O.L.L. Richardson Blend

ND(0.5) Riv. Iowa Booster (Waterman)

1.1 Riv. Gage Delivery (Gage)

0.61 Riv. 7th + Chicago (Reservoir)

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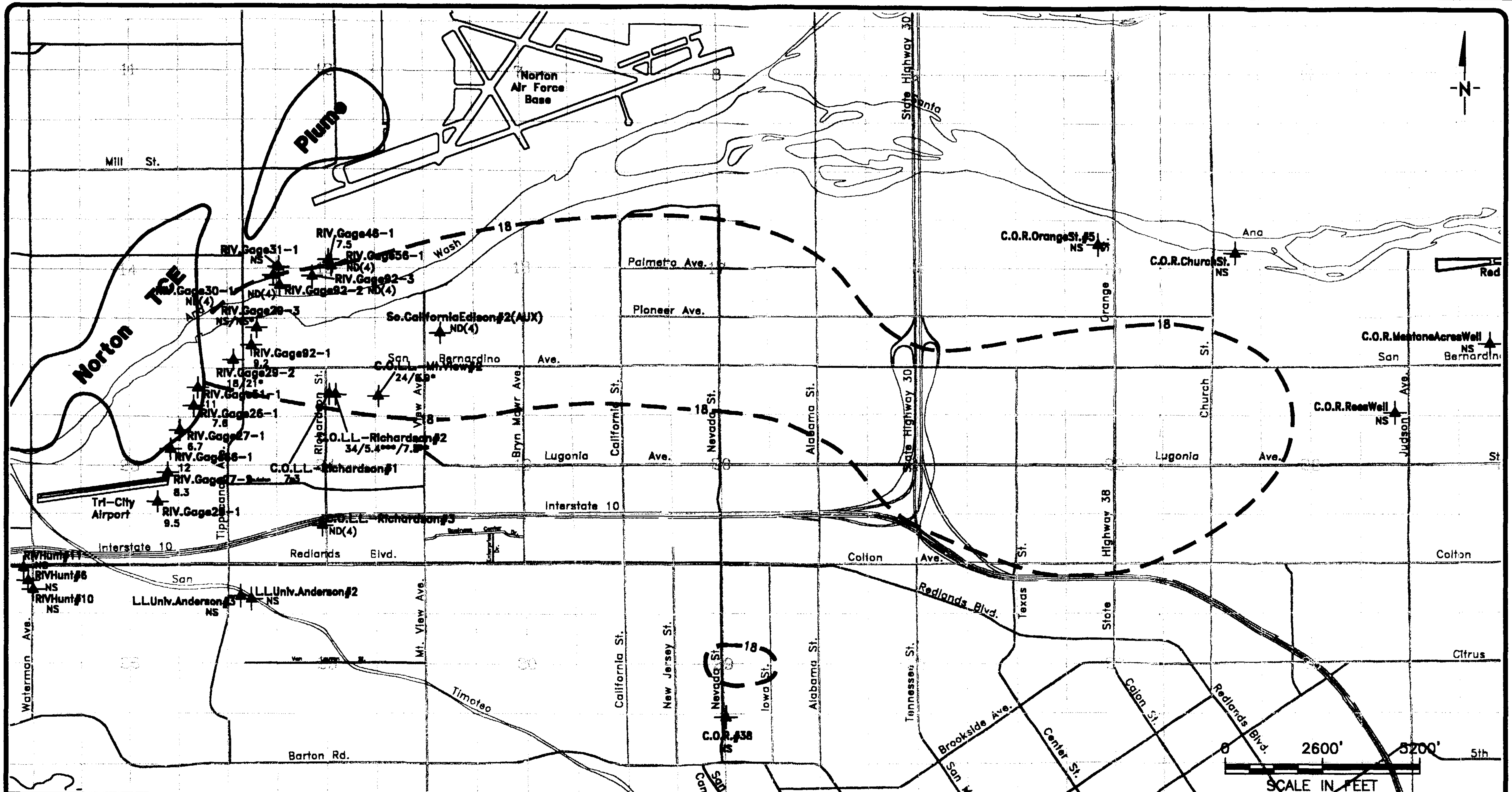
TITLE: WSCP Production Well Sampling Program TCE Data Results January 1999

LOCATION: LOCKHEED MARTIN REDLANDS, CALIFORNIA

HSI GEOTRANS A TETRA TECH COMPANY

CHECKED:	Roy Marroquin	FIGURE: 1
DRAFTED:	Hector Magaña	
PROJ.:	P077-101	
DATE:	02/04/99	



EXPLANATION

- Wells Currently Sampled Under the Existing WSCP Sampling Program
- —18— Approximate 18 µg/L Perchlorate Plume Location (1998 Interpretation)
- —5— Approximate TCE Plume Location 5 µg/L (1998 Interpretation of Norton AFB Plume, by Norton)

6.6	Perchlorate (µg/L) Results
ND(4)	Not Detected at Indicated Detection Limit
NS	Not Sampled
*	Twice-Monthly Sampling Results
**	Split Sample Result
***	Confirmation Sampling Results

6.0	C.O.L.L. Mountain View Blend - Timoteo
6.2	C.O.L.L. Mountain View Blend - Lawton
ND(4)	C.O.L.L. Richardson Blend
ND(4)	Riv. Iowa Booster (Waterman)
6.0	Riv. Gage Delivery (Gage)
ND(4)	Riv. 7th + Chicago (Reservoir)
5.7	Gage Arlington

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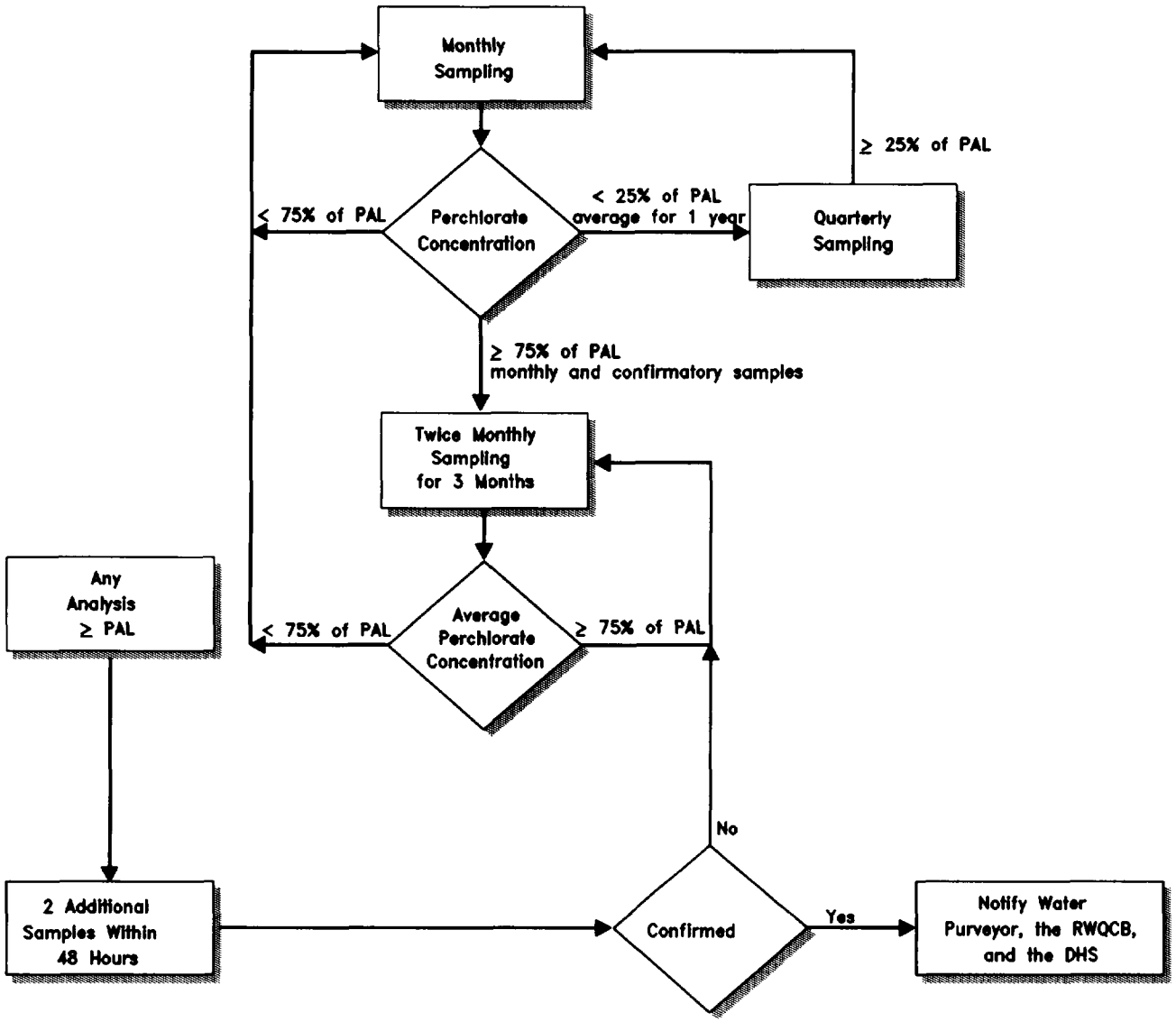
TITLE: WSCP Production Well Sampling Program
Perchlorate Data Results January 1999

LOCATION: LOCKHEED MARTIN
REDLANDS, CALIFORNIA

HSI GEOTRANS
A TETRA TECH COMPANY

CHECKED:	Roy Marroquin	FIGURE:
DRAFTED:	Hector Magaña	2
PROJ.:	P077-101	
DATE:	02/04/99	



Footnote:

Perchlorate Provisional Action Level (PAL) = 18 µg/L (California Department of Health Services, May 1997)

TITLE:	Decision Matrix for Sampling Production Wells for Perchlorate		
LOCATION:	LOCKHEED MARTIN REDLANDS, CALIFORNIA		
HSI GEOTRANS A TETRA TECH COMPANY	CHECKED:	Ron Bruns	FIGURE: 3
	DRAFTED:	Hector Magaña	
	PROJ.:	P077-101	
	DATE:	09/25/98	

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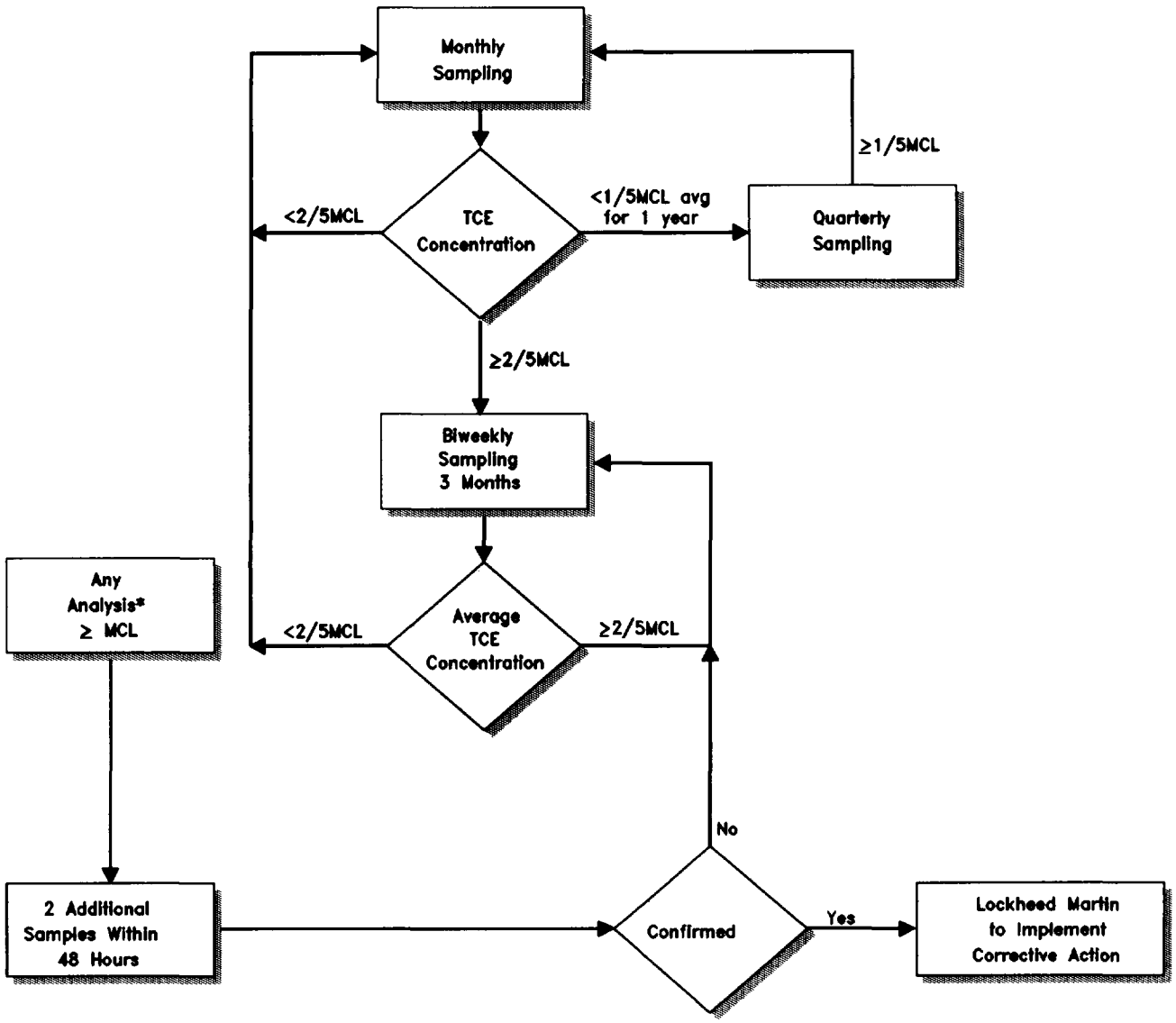

Footnote:

* If, at a specific well, blending is occuring to provide acceptable water for compounds other than TCE, then no corrective action may be necessary as long as the concentration of TCE is less than 5.0 μg/L in the finished water.

TCE MCL = 5 μg/L (California Regulations, Title 22, Division 4, Chapter 15, Section 64444)

TITLE: Decision Matrix for Sampling of Production Wells for TCE from the Crafton-Redlands Plume

LOCATION: LOCKHEED MARTIN REDLANDS, CALIFORNIA

HSI GEOTRANS A TETRA TECH COMPANY

CHECKED:	Ron Bruns
DRAFTED:	Hector Magaña
PROJ.:	P077-101
DATE:	09/25/98

FIGURE: 4

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ATTACHMENT A

GEOLIS FIELD FORMS

ATTACHMENT A

GEOLIS FIELD FORMS
(Available Upon Request)

ATTACHMENT B

CHAIN-OF-CUSTODY RECORDS AND LABORATORY DATA SHEETS

ATTACHMENT B

CHAIN-OF-CUSTODY RECORDS AND LABORATORY DATA SHEETS
(Available Upon Request)

ATTACHMENT C

LEVEL III
QUALITY ASSURANCE/QUALITY CONTROL DOCUMENTATION

ATTACHMENT C

LEVEL III
QUALITY ASSURANCE/QUALITY CONTROL DOCUMENTATION
(Available Upon Request)